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called Dilaram." No doubt the Khash River is an interesting stream, and we might like to be told what kind of a valley it has, what its volume is, and its direction of flow, where the hills are, and their character. So far as we are concerned, it might as well be in the Sahara. So we are led from one inconsequential detail to another, and at the end of a paragraph, at the end of weary pages, we wonder if anything in that part of the world has a place or a meaning.

It is interesting to read that Seistan has suffered progressive dessication, but we wonder how this is arrived at by a "mental survey of the country." True it is affirmed that there are old beaches and deltas, but again there is no coherent account of the evidence, and not a single photograph, though the party made good pictures of some kinds of things. Two maps, following page 177, do illustrate the delta of the Helmand, but as a whole the account emphasizes that rarity of good geographic description on which Professor Davis has laid much emphasis. It is without method and conveys no adequate idea of the region, of its features, or of the principles illustrated in its physical history. A large number of full-page plates give effective reproductions of ancient human structures.

We have rarely seen a volume in which one could read so much and get so little. There are many facts, as there are many grains in an acre of Seistan sand. As to relative dryness no conclusion is here urged. The plan proposed in the preface to record information rather than aim at literary effect, is fully realized.

A. P. BRIGHAM.

AUSTRALASIA AND OCEANIA

Reisen in Kaiser-Wilhelmsland (Neuguinea). Von Dr. Otto Schlaginhaufen. 19 pp. Map, ill. Abhandl. und Berichte des Kgl. Zool. und Anthropol.-Ethnogr. Museums zu Dresden, Vol. XIII, 1910, No. 1. B. G. Teubner, Leipzig, 1910. Mk. 6.50. 12½ x 10½.

When the German New Guinea Company made its start as a political balance weight to the British North Borneo Chartered Company there was immediate prospect of the exploration, even if not the commercial exploitation, of the northern slopes of the great and little-known island. But when that company surrendered its plans to an imperial protectorate the interest slackened and for several years no activity of discovery was manifest. Now that the colony has been associated with the earlier and better founded settlement of the Bismarck Archipelago there has been a considerable revival of interest. In this pamphlet Dr. Schlaginhaufen presents the cursory record of two inland trips which in 1909 he accomplished into the unknown inner land of New Guinea. One was the exploration, to a distance of more than a degree of latitude, of the lower course of the Kaiserin Augusta river, which debouches a few miles north of 4° S. The other was a mountain climb across the mass of the Torricelli Mountains and a visit to the inland communities of Apur and Akur. Every such report, brief though it be, is of inestimable value in adding to our knowledge of this least-known of the great islands of the world.

WILLIAM CHURCHILL.

EUROPE

Dünenbuch. Werden und Wandern der Dünen, Pflanzen- und Tierleben auf den Dünen, Dünenbau. Bearbeitet von F. Solger, P. Graebner, J. Thienemann, P. Speiser und F. W. O. Schulze. viii and 404 pp. Ills. Ferdinand Enke, Stuttgart, 1910. Mk. 10. 9 x 6.

A description and study of sand dunes on the German coasts. The geological part was written by Professor Solger, the botanical by Professor Graebner, the zoological by Dr. Thienemann, the entomological by Dr. Speiser, and the technical by Professor Schulze.

Professor Solger distinguishes three types of dunes which correspond each to a certain type of shallow coast. On bluff coasts no dunes are formed because the land, being continuously eaten away by the waves, leaves no place for the sands to collect. The shallow coast in process of advancement is the typical dune coast. It has a sand beach with a wooded or shrubby hinterland back of it. The sand blowing inland from the beach gathers along the out-

skirts of vegetation forming the first line of dunes ("Ur-Düne") on which *Psamma Arenaria* soon appears as the first pioneer of vegetation. In proportion as the coast advances, and the width of the beach thus increases, a second line of dunes is formed along that new border line of vegetation, and is occupied by *Psamma* in its turn, while the one farther back is now invaded by species from farther inland. This process repeats itself over and over again until a complete system of parallel ridges accompanies the coast, always with the floral transition from *Psamma* at the front to a more and more differentiated vegetation farther back, each stage of which corresponds to an anterior stage in the formation of the coast.

Another type is found in those locations where, owing to strong coastal currents which carry the sands away, the shore line is practically stationary. Therefore the sands which are blown up from the beach accumulate pretty nearly at always the same places, so that one line of dunes only can be formed but of a height considerably superior to that of the previous type. This type is best developed on the *Nehrungen* (spits) of the Baltic coast. The dunes there used to be so stationary that considerable forests grew on them. But during the Seven Years' War they were deforested by the Russian troops, and since then the dunes have wandered all across the spits, burying everything under them. The author devotes a special chapter to the heroic efforts made in these provinces to stop further progress of the dunes, and prevent the complete filling in of the lagoons (*Haffe*) by reforesting the dunes.

A third type is found on shallow coasts in process of recession. It occurs wherever a beach which was formed under the protection of a neighboring headland loses that protection by the destruction of the latter. Then the sea begins to eat away the beach and sooner or later also attacks the dunes, forming a dune bluff. In proportion as the coast recedes, the sands taken from the original dunes are blown farther inland, the wind pushing the dunes, as it were, before it until they finally rest on the soil of the land itself, and when this land is attacked by the waves in its turn it offers the misleading aspect of a bluff coast with dunes on top of the bluff.

The author illustrates these processes very fully by exact reference to different parts of the German coast near popular seaside-resorts, thus enabling even persons not especially acquainted with the geology of Northern Germany to study these processes *in situ*. The American observer who has studied similar problems on the shores of Cape Cod and its neighborhood will find there many points of comparison along different lines.

In an additional chapter the author proceeds to a short study of desert dunes, with especial reference to the inland dunes of Northern Germany, developing his special theory of the latter having been formed under the influence of prevailing east winds.

Professor Graebner, in his description of plant life on the dunes, first explains the general conditions needed for dune vegetation and then discusses the various types of plants found on the different types of dunes. On the beach itself and the "white" sand dune succulent and sand-catching species predominate (*Salicornia*, *Hockenya*). At a later stage *Hordum*, *Petasites*, etc., fasten the sand with the network of their roots, allowing the first annuals to grow. After them various *algae*, *Cakile maritima*, *Salsola* and others already give a "grey" aspect to the dune forming the first vestiges of soil which allow the growth of biennials (*Oenothera*), and of certain creeping shrubs as *Salix repens*, *Rosa pimpinellifolia*, etc. Later still, the "shrub dune" bears *Hippophaë*, *Salix daphnoides*, *Quercus pedunculata*, and in its moist hollows a pronounced marsh and salt flora can develop. The "wooded dune" represents the conclusion of the process, and the variety of its trees is greater than might be supposed. The inland dunes, too, are treated in a botanical chapter by themselves.

The zoological parts contain principally enumerations and descriptions of the various animals, birds, reptiles, and insects which inhabit the dune region, together with hints about how to find them; and the last chapter describes the technique of the different ways and methods of regulating the progress and formation of dunes in the past and present.

The book is richly and well illustrated, and though intended principally for the intelligent lay reader, contains much that is of value also to the specialist.

MARTHA KRUG GENTHE.